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ABSTRACT

This content analysis study evaluated the research methods and statistical techniques employed in studies reported in the professional journal, "TECSE" (Topics in Early Childhood Special Education) between 1990 and 1993. Research articles comprised 37 percent of all articles (n=120) published during this period. The most frequently utilized statistical techniques were descriptive statistics, t-tests, multiple regression, analysis of variance, and correlation. Nonintervention designs represented the majority of research articles, with causal-comparative being the most prominent type. Of the intervention designs, pretest/posttest was the most frequently utilized method. The majority of article authors were female. (DB)

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The Use of Research Methods and Statistics in TECSE, 1990-1993: A Content Analysis

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Running head: CONTENT ANALYSIS

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Abstract

The primary purpose of the present study was to examine the research methods and statistical techniques employed in the Topics in Early Childhood Special Education research articles between 1990 and 1993. The most frequently utilized statistical techniques were descriptive statistics, t-tests, multiple regression, analysis of variance (ANOVA), and correlation. Nonintervention designs represented the majority of research articles, with causal-comparative being most prominent. The number and gender of article authors were also addressed.

The Use of Research Methods and Statistics in TECSE, 1990-1993: A Content Analysis

Five types of manuscripts are published in Topics in Early Childhood Special Education (TECSE): original research, literature reviews, conceptual statements, position papers, and program descriptions. This study was most interested in those TECSE articles published as original research. Our focus was on what research methods and statistics were represented in TECSE articles disregarding the topics on which the research was done. It was felt that this information would provide indicators of the research and statistics knowledge bases valuable for understanding and appreciating not only TECSE articles, but research reported by other means or in other journals.

There have been a number of studies which investigated the quality and quantity of research methods and statistics in articles published in the journals of education (Goodwin & Goodwin, 1985; Sabatino, 1981; Ward, Hall, & Schramm, 1975; West, Carmody, & Stallings, 1983; Willson, 1980). Sabatino (1981), for example, examined four major special education journals over a 5-year period, 1972-1977. One of the major focuses of his study involved the content analysis of the research designs utilized in the literature to determine whether journal

content was practical in facilitating communication between consumers and researchers. The results of the study showed that a significant portion of the articles across the journals were experimental in nature, and that there was a decline in professional issues and position papers over the years.

Goodwin and Goodwin (1985) also evaluated the types of statistical techniques utilized in the articles published in the 1979 to 1983 issues of the American Educational Research Journal. Their purpose was to examine the extent to which the content coverage of graduate-level statistics texts matched the statistical techniques used in the articles. They concluded that almost 70% of the statistical techniques used were at either the basic or intermediate level of complexity, and that an understanding of both levels of statistical tools was essential to become better informed consumers of the journal.

Given that educators and prospective educators in the field of special education gain and exchange knowledge largely through professional reading, a periodic update of the current usage of the research methods and statistics and of their trend would seem requisite to understanding the professional research literature. The primary purpose of the content analysis of the present study was,

therefore, to provide a synopsis and overview of the methods and statistics represented by TECSE articles over a recent 4-year period. A secondary interest was in the number and gender of the article authors.

Method

Articles

All articles, except book reviews, published in TECSE for the four year period from 1990 to 1993 were selected for this study (N=120). The 120 articles were separated into two categories: research articles (original research) and nonresearch articles (literature reviews, conceptual statements, position papers, and program descriptions). The research articles were further examined to identify the types and frequencies of research methods and statistical techniques used.

Types of Methods and Statistics

The statistical techniques used in the research articles were coded as basic, intermediate, or advanced techniques. The research methods used were coded as intervention or nonintervention. Intervention designs required the manipulation of a variable, whereas the nonintervention designs did not. The specific types of statistical techniques and research methods are outlined in Tables 1 and 2, respectively.

Coding Procedure

Nonresearch articles were coded by the subcategories as presented earlier. For research articles, two coding forms were developed. The form used to code the statistical techniques was modeled after Goodwin and Goodwin's (1985) classification of statistical techniques. A statistic was counted only one time per article even if it appeared more than once. The coding form for the research methods consisted of several types of designs listed under the main headings of intervention and nonintervention. When more than one research method was employed in a single article, each method was coded into the appropriate type. Consequently, the total number of research methods exceeded the total number of articles reviewed. In addition, articles were also coded according to the number and gender of authors. The authors were coded as single authorship, co-authorship, or multiple authorship. The gender of each author, in relation to the order of author listed, was also coded.

The authors of the present study independently coded the 32 articles in the four 1990 issues. This was done to determine coder consistency. Agreement was 94%. The first author subsequently coded the 1991 issues, while the second author coded the 1992 and 1993 issues. Any uncertainties were resolved by returning to the articles

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and both coders reaching consensus.

Results

Nonresearch articles represented a significant portion of content in TECSE during the 1990-1993 period, accounting for 63% of the articles reviewed. The majority of the nonresearch articles included position papers.

With respect to research articles, Table 1 presents the frequency of statistical techniques used, relevant to the types reviewed. As can be seen from Table 1, the

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Insert Table 1 about here

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basic techniques were the most frequently utilized statistical tools (72%), of which descriptive methods were most prominent. Although the basic techniques accounted for the majority of the statistics used during the 1990-1993 period, there was a trend indicating a decrease in the use of the basic techniques, coupled with a steady decline in the use of descriptive statistics. There was, however, no clear pattern of a corresponding increase in the intermediate or advanced techniques. Of the intermediate techniques (16%), multiple regression was most frequently employed. Least found were the advanced techniques (12%).

A further examination of Table 1 was conducted by

comparing the frequencies of all statistical methods listed. Descriptive statistics, t-tests, multiple regression, analysis of variance (ANOVA), and correlation were most used in relative frequency and represented 81% of the total statistical methods employed. None of the research articles published between 1990 and 1993 used planned orthogonal comparisons, trend analysis, factorial analysis of covariance (ANCOVA), part/partial correlation, discriminant analysis, path analysis, or meta analysis listed in Table 1.

Insert Table 2 about here

The frequency of research designs used in TECSE from 1990 to 1993 is shown in Table 2. The majority of the research articles (68%) represented nonintervention designs with the causal-comparative method being most frequently used. Furthermore, there was an increase in the use of the causal-comparative method over this period. Other nonintervention designs showing relatively high frequencies included survey and qualitative methods. Of the intervention designs (32%), pre-test/post-test was the most frequently utilized method.

Insert Table 3 about here

Table 3 provides the number of authors for each article and their respective gender across both research and nonresearch articles. The number of authors per article was fairly evenly divided, although multiple authorship was slightly more prevalent. With regard to gender, the majority of the authors were female, and this trend continued throughout the period.

Discussion

With the renewed focus and emphasis on early childhood education since the passage of P. L. 99-457, it is not surprising that nonresearch articles, particularly position papers, represented a large percentage of the TECSE articles during the years 1990-1993. One would expect that such massive legislation would result in a surge of professional issues and position taking in the field.

In regard to the usage of statistical techniques in TECSE research articles, the most frequently utilized statistics were similar to those reported by Goodwin and Goodwin (1985) including descriptive statistics, multiple regression, ANOVA, and correlation which are either basic or intermediate in levels of complexity. The other basic

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technique most frequently employed in TECSE was the t-test. In addition, a decrease in the use of descriptive statistics was readily noticeable, which is consistent with the previous findings (West et. al., 1983) indicating a trend toward more robust statistical methods.

Unlike the results of Sabatino's (1981) study, the majority of the research articles in TECSE from 1990 to 1993 represented nonintervention designs such as causal-comparative, survey, and qualitative studies. It is likely, given the pressing needs for service delivery of children developmentally at risk, that research in early childhood special education may be primarily field based where opportunities for random assignment and establishment of control groups are difficult to achieve. This could further explain the high frequency of the causal-comparative method and increase in its use over the period.

As to the number of authors per article, it was fairly evenly divided with the majority of the authors being female. The greater number of female authors seems to reflect female dominance of the field as men tend not to choose early childhood education as their career for various reasons speculated elsewhere (Seifert, 1988).

Overall, the results of the content analysis of the present study were comparable to those of previous studies

in terms of types and difficulty of statistical techniques. However, there were several unique aspects of TECSE research which appeared to be germane to the field of early childhood special education, that is, more field-based studies and greater involvement of females. Generalizability of these findings would be enhanced by similar studies being conducted in TECSE and other journals in education on a periodic basis. Bringing content analysis of the journals up to date is also essential for keeping consumers informed as to trends and usage of statistical and research methods.

Table 1

Techniques by Frequency and Percentages of Total for Basic, Intermediate, and Advanced Statistics

Statistical technique	1990	1991	1992	1993	Frequency	%
Descriptive	12	10	7	5	34	
Correlation	3	1	1	1	6	
Chi square	2	0	0	3	5	
T-test	1	8	4	3	16	
One-way ANOVA	2	1	1	3	7	
Total basic techniques	20	20	13	15	68	72
Factorial ANOVA	2	0	0	1	3	
Planned orthogonal comparisons	0	0	0	0	0	
Post-hoc multiple comparisons	0	0	1	0	1	
Trend analysis	0	0	0	0	0	
One-way ANCOVA	0	0	0	1	1	
Factorial ANCOVA	0	0	0	0	0	
Part/partial correlation	0	0	0	0	0	
Multiple regress.	2	1	4	3	10	
Total intermediate techniques	4	1	5	5	15	16

(table continues)

Statistical technique	1990	1991	1992	1993	Frequency	%
Discriminant analysis	0	0	0	0	0	
Path analysis	0	0	0	0	0	
Canonical correlation	1	0	0	0	1	
Factor analysis	3	1	0	1	5	
Cluster analysis	0	0	0	1	1	
One-way MANOVA/ MANCOVA	1	0	0	0	1	
Factorial MANOVA/ MANCOVA	1	0	1	1	3	
Total advanced techniques	6	1	1	3	11	12
Totals	-	-	-	-	94	100

Table 2

Frequency and Percentages of Total for Intervention and Nonintervention Research Designs

Research designs	1990	1991	1992	1993	Frequency	%
True experiment	2	1	0	0	3	
Quasi-experiment	0	2	0	1	3	
Pre-test/post-test	1	5	0	2	8	
Single-subject (time series)	0	2	1	1	4	
Total intervention	3	10	1	4	18	32
Case study	0	1	1	0	2	
Survey	2	1	3	2	8	
Longitudinal	1	4	1	0	6	
Cross-sectional	0	0	2	0	2	
Correlational	1	1	1	1	4	
Causal-Comparative	1	1	3	5	10	
Qualitative	3	1	3	0	7	
Total non-intervention	8	9	14	8	39	68
Totals	-	-	-	-	57	100

Table 3

Frequency and Percentages of Total for Number and Gender of Authors

Number of authors	1990	1991	1992	1993	Frequency	%
Single author	9	10	9	10	38	32
Two authors	9	8	10	10	37	31
Multiple authors	14	12	9	10	45	37

Gender of authors	1990 F/M	1991 F/M	1992 F/M	1993 F/M	Frequency
First author	17/15	22/7 1?	16/11 1?	22/8	77/41 2?
Second author	15/5 1?	12/8	11/8 1?	9/10	47/21 2?
Third author	9/3 1?	8/4	8/1	6/4	31/12 1?

Note. The "?" within the gender of authors table represents that the gender of an author could not be determined based on the information given.

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